



# United Technologies



## Value Management

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# Main Message

**What We're Doing:** Pratt & Whitney rigorously applies Value Management

**What we need Program Executive Officers to do:**

1. Continue demanding affordability. (Thank you!)
2. Encourage use of VECP's

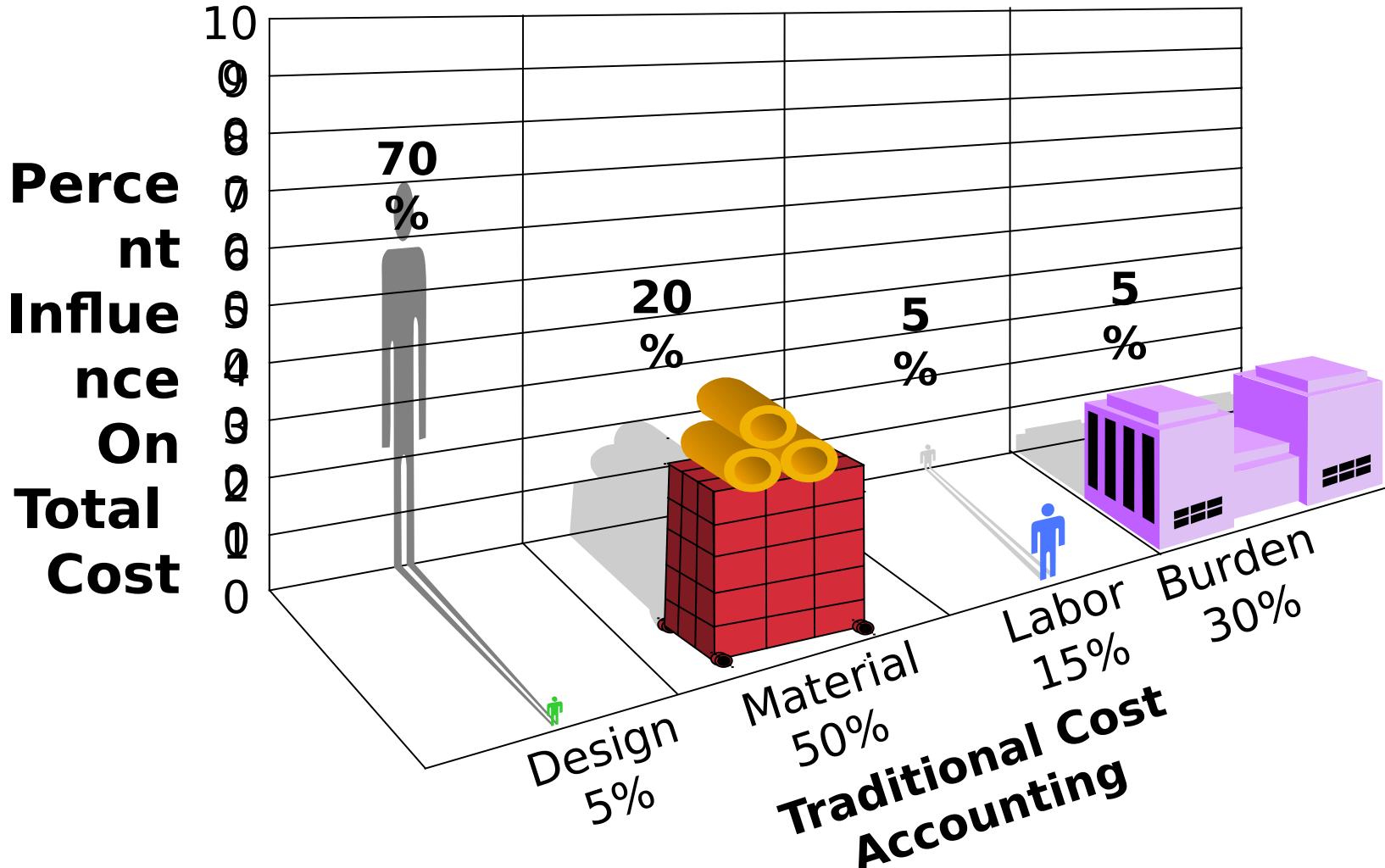
# Pratt & Whitney Success Stories

- Over 14,000 ideas for F135 jet engine for Joint Strike Fighter
- Commercial engine: \$1/2 Million savings without weight increase
- Driving to do VM earlier in Design

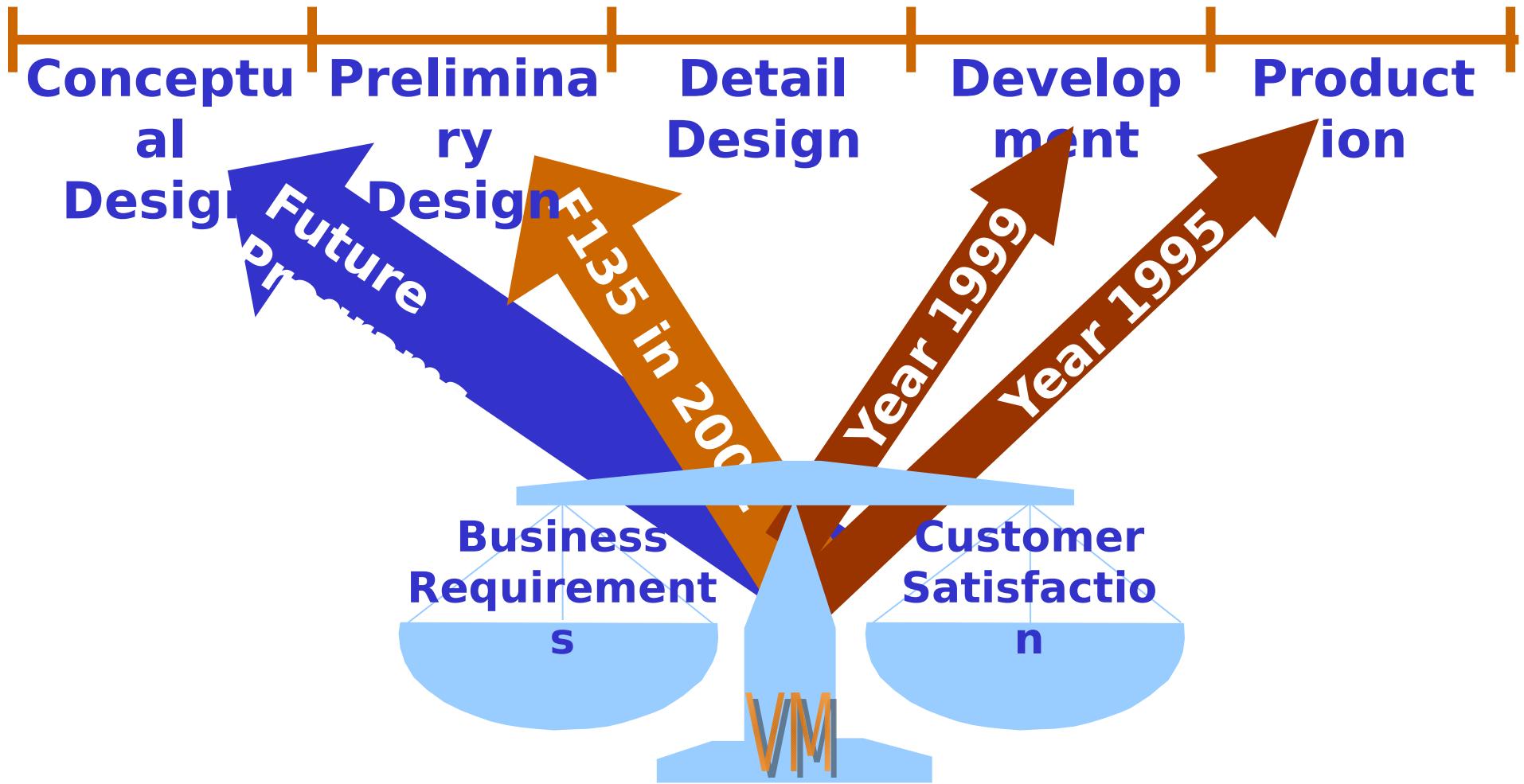


# Design Influence on Value

Since up front decisions impact value the greatest, it's **imperative** to address affordability in concept stage. Create performance/cost/weight relationships & link to Affordability initiatives.



# Applying Value Management



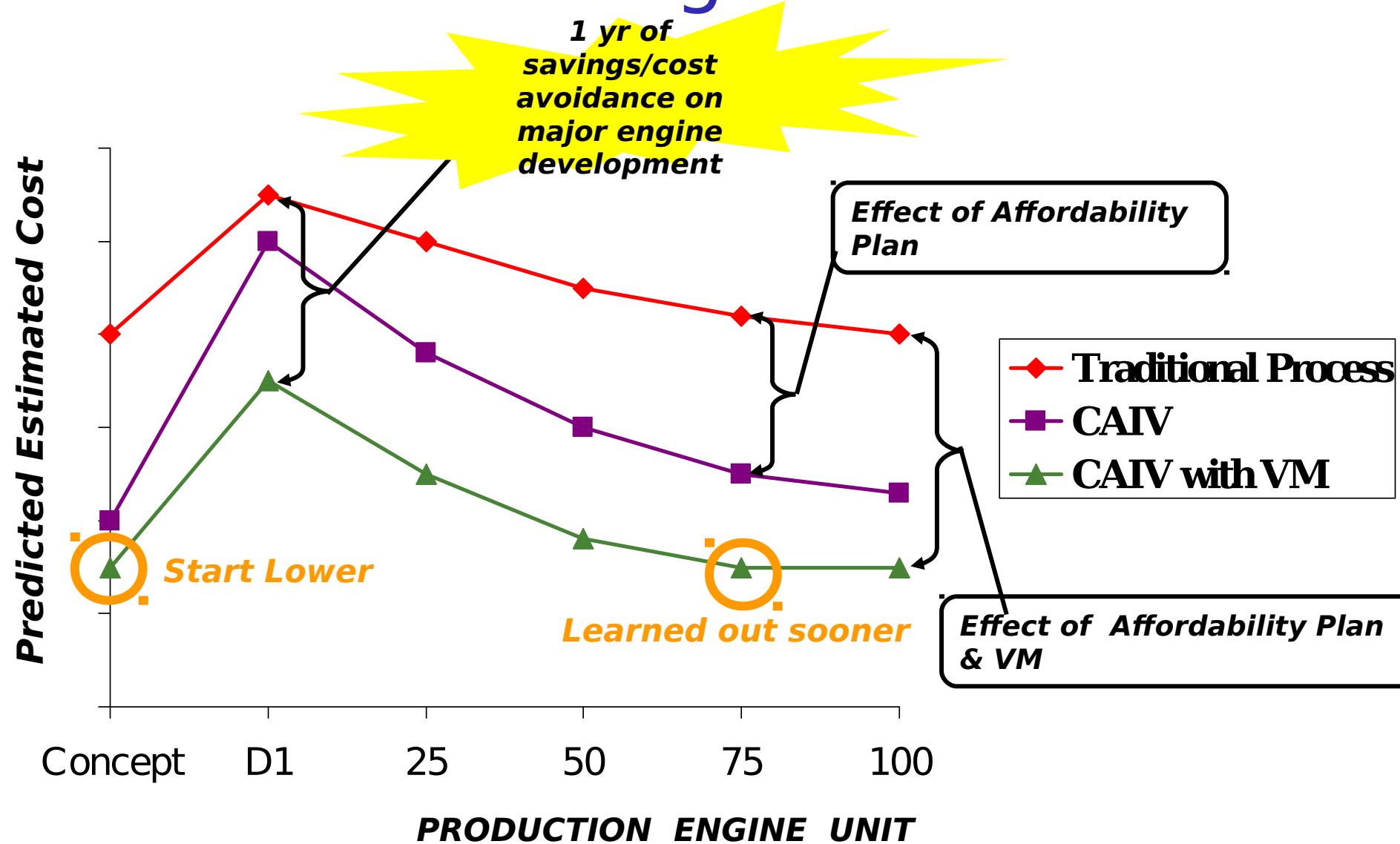
**Deliver essential functions in the most profitable manner**

**Intellectuals solve problems;  
geniuses prevent them.**

**--Albert  
Einstein**

We think we've discovered how to  
be geniuses relative to affordability.

# Product Learning Curve Effect



# Failures (seeds of Opportunity)

- Resistance toward VM in a few programs
  - Not invented here?
- A VM group disbanded when its executive retired
- Process shortened until it didn't deliver.
  - Grasshopper without legs is deaf?
  - Lesson learned: match length of study to magnitude of problem.

# Recommended Improvements

- Pull VM into conceptual design.
  - Avoid problems instead of fixing them.
- Use ranges of acceptability (versus hard points).
  - Increase potential to balance business needs with customer expectations
- Continue VM throughout product development
- Promote use of VECP's

# Back-up Slides

# Encountered Barriers

- Organizational Culture
  - Metrics drive behavior
  - resistance at different tiers
  - (embracing change: easier said than done)
- Failure to implement opportunities
  - inadequate resources
  - risk aversion
  - schedule constraints

# Balancing Design

Deliver essential functions in the most profitable manner.

Ensuring **stakeholders** & **requirements** are working together to satisfy customer needs.



# Why VM Works

“The mere formulation of a problem is far more often essential than its solution, which may be merely a matter of mathematical or experimental skill.

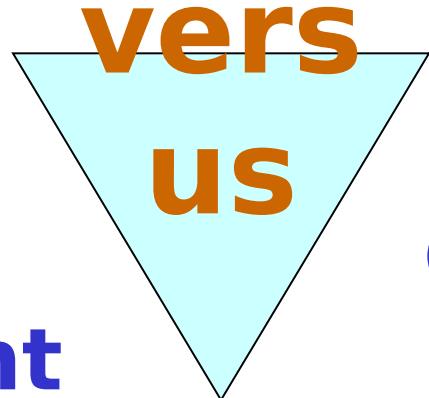
To raise new questions, new possibilities, to regard old problems from a new angle requires creative imagination and marks real advances in science.”

- Albert Einstein

Function analysis via FAST  
modeling is all about  
understanding problems *with* new

# **Value Management**

- 2-3 days analyzing the problem
- full day brainstorming
- 2 days sifting ideas
- 1 day packaging and analyzing
- Weeks implementing ideas



# **Conventional Problem Solving**

- A couple of hours deciding what to work on
- a half hour brainstorming
- Weeks to try to make the ideas work, revisiting brainstorming

# Key Function of Customer Input

- **Communicate Ranges of Acceptability**

- Minimum Acceptable values
- Maximum desired values
- Perception of value delivered by competing products

Several Alternatives

--Vs.--

- **Communicate Requirements**

- Single data points
- Only know customer ideal

Limited Choices

Make Balanced Trades Possible